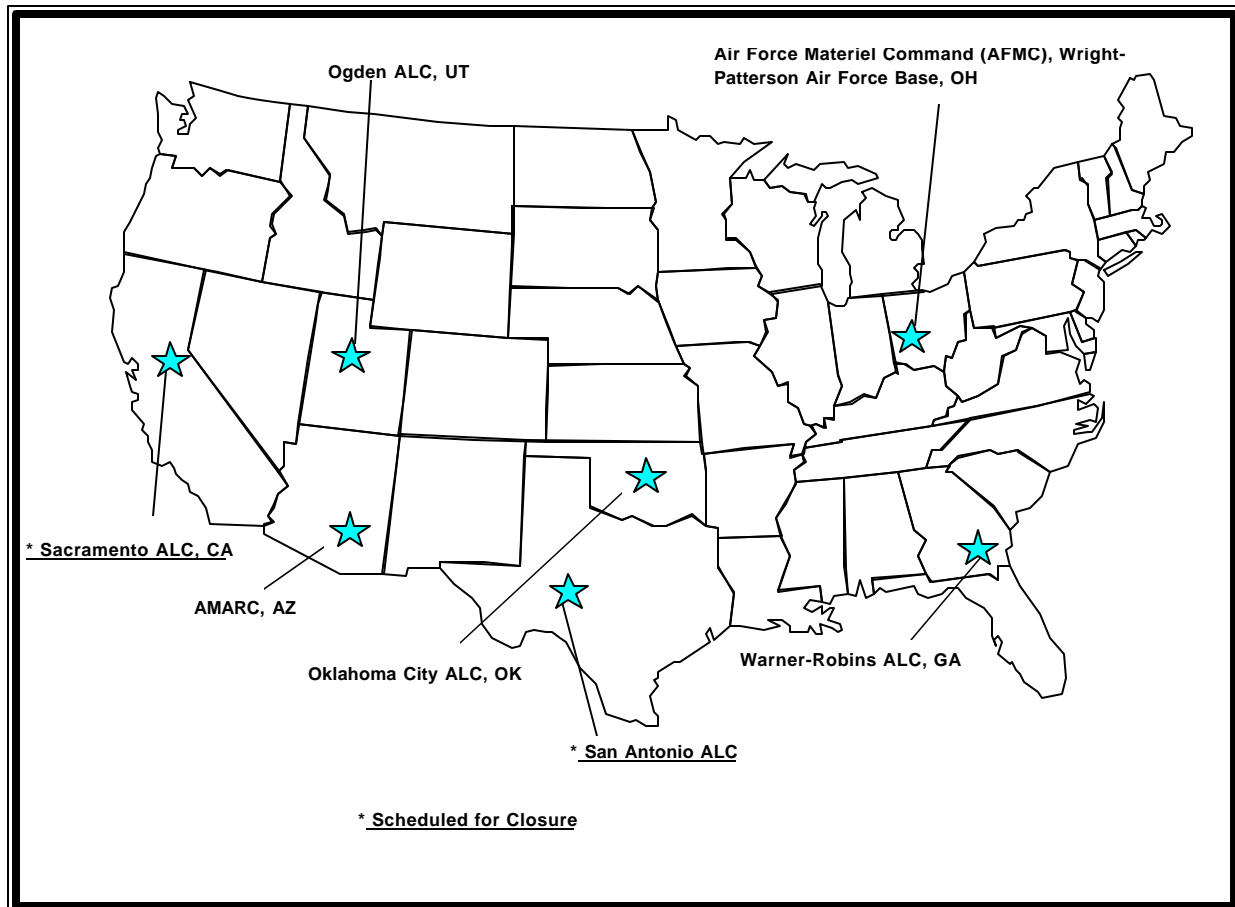


Air Force Depots



4.0 AIR FORCE

On 10 January 1991, Secretary of the Air Force Donald Rice announced that Air Force Logistics Command (AFLC) and Air Force Systems Command (AFSC) would merge on 1 July 1992. The phased integration of the commands began with headquarters functions. This included creation of a provisional headquarters and an AFSC detachment at Wright-Patterson AFB, OH. The time-phased transfer of responsibilities culminated in the dissolution of the two commands and creation of the Air Force Materiel Command (AFMC).

The command headquarters at Wright-Patterson AFB has tremendous resources and responsibilities, directly controlling over 50 percent of the Air Force's budget in over 450 varied programs. AFMC supports over 10,000 aircraft and 32,000 engines, while at the same time running Air Force medical and test schools and operating 17 bases.

AFMC's role is to turn global power and reach concepts into capabilities - to design, develop, and support the world's best air and space weapon systems. The corner stone of

AFMC will be integrated weapon system management (IWSM), the "cradle-to-grave" management of all Air Force systems. This approach provides a single focal point for our customers - that single focal point will be the system program director, which has responsibility for all aspects of a system or commodity throughout its life. It increases the system program director's authority and flexibility, integrates all critical processes and eliminates the "seams" that currently exist between development and support.

The move to IWSM and the emphasis on total quality management have resulted in a major reorganization of the AFMC structure. The AFMC centers are operating through "product" and "service" directorates that will support the AFMC's DOD customers along with some 81 nations around the world. The reorganization resulted in a significant new approach to the way the air logistics centers (ALC) have been doing business, the centers have changed from being organized along functional lines. The ALCs are now restructured along product and service lines. Each ALC work force will support products such as aircraft and commodities, along with services such as financial management and contracting rather than broad functional organizations such as maintenance and distribution.

The depot maintenance mission for Air Force Materiel Command is to provide the operational combat commands the support they require to effectively execute their wartime missions. Key elements of this support are the ALC's depot level maintenance repair facilities and contractors. It is essential that the peacetime personnel, facilities, and equipment reflect preparedness for mobilization.

The Air Force has four depot level maintenance activities as shown on the map: Hill AFB, UT; Davis-Monthan AFB, AZ; Tinker AFB, OK; and Robins AFB, GA. AFMC's depot activities comprise an industrial complex that consists of one of the major industrial activities of the United States. The depots accomplish repair, overhaul, and modification of aircraft, missiles, engines, other major end items, and exchangeable items in the Air Force inventory. AFMC depot maintenance capability is critical to the successful completion of the Air Force wartime mission; therefore, the peacetime structure of depot maintenance repair assignments and capabilities must be established and maintained with wartime missions as the prime criteria.

4.1 Aerospace Maintenance & Regeneration Center (AMARC), Davis-Monthan AFB, Arizona

4.1.1 OVERVIEW

HISTORY:

- The 4105th Army Air Force Unit was established at Davis-Monthan AFB in April 1946 to store aircraft and prepare them for one-time flight to depot for overhaul.
- During the Korean conflict, the center provided aircraft and aircraft parts.
- In 1965, the center was renamed the Military Aircraft Storage and Disposition Center (MASDC) and it assumed the role of storage facility for aircraft from all Services.
- During the mid-1960s, MASDC provided aircraft and parts for the Vietnam conflict.
- In 1973, the center's inventory ballooned to an all-time high of 6,080 stored aircraft.
- In 1976, a series of full-scale aerial target programs was initiated involving the F-102 and the F-4.
- In 1981, a storage facility was added to Norton AFB, CA to preserve TITANII, THOR, and ATLAS missiles used by the Space Division for its satellite launches.
- In October 1985, the center's name was changed to the Aerospace Maintenance and Regeneration Center (AMARC).
- In 1987, AMARC became the focal site for the elimination of 443 ground launch cruise missiles or GLCM weapon systems.
- In 1993, TITAN II missiles began arriving at AMARC for storage.
- In 1994, AMARC accomplished the elimination of 252 B-52s under the START treaty.
- The YC-15 prototype aircraft leaves AMARC for Long Beach, CA to begin a new career as a test platform.

MISSION: The mission of the Aerospace Maintenance and Regeneration Center (AMARC) is to support our customers Storage, Regeneration, Reclamation and Disposal needs in war and peace. AMARC accomplishes this by providing quality products and services on time and at the right price. The center stores and maintains over 50 MDS aircraft and other aerospace vehicles, including a variety of aerospace-related items such as production tooling, pylons and engines. During wartime or contingencies, AMARC is often tasked to withdraw airframes and components. Delivery of aircraft and aerospace products to our customers occur either by overland (rail or truck) transport, air shipment or are flown out of AMARC. During Operation Desert Storm, parts from AMARC stored aircraft kept B-52, F-111, F-4, OV-10, C-130, A-7 and P-3 aircraft as well as some helicopters flying. AMARC's projects include some of the most interesting and challenging in the Air Force. For Example, AMARC is tasked to provide support in accordance with the Strategic Arms Reduction Treaty (START) with the former Soviet Union. This means AMARC will eliminate 350 B-52 heavy bombers over a three and one half-year period. AMARC's successful implementation and execution of this treaty will reduce and limit strategic offensive arms and strengthens international security. For over a quarter of a century, AMARC withdrew and successfully prepared over 750 fighter aircraft to meet requirements under the mission known as the full-scale aerial target (drone) program, where aircraft are piloted solely by remote control. AMARC is now preparing QF-4 aircraft for flight. In

fiscal year 1997, AMARC received 160 aircraft and processed 263 into storage. Two hundred aircraft were withdrawn from the center, 60 by flyaway and 140 by overland transport. The value of these aircraft was approximately \$648M. Also in fiscal year 1997, 26,992 parts, with an approximate value of \$639M, were removed and returned to the Department of Defense to support our customers.

LOCATION:

- AMARC lies adjacent to Davis-Monthan AFB, within the city limits of Tucson, Arizona.
- Tucson is located in southeastern Pima County, the second largest Arizona County by population, and lies approximately 65 miles north of the international border and 130 miles west of the New Mexico border. Tucson is partially surrounded by several rugged mountain ranges of crystalline bedrock.

SIZE:

- AMARC occupies 2,600 acres of desert land equating to any area slightly larger than four square miles. Eighty-nine real property buildings are situated within AMARC and are valued at approximately \$64M.
- Real Property buildings account for a total of almost 660,000 square feet and are comprised of 428,629 square feet of shop space, 157,777 square feet of warehouse space and 73,222 square feet of administrative space.
- AMARC lies adjacent to Davis-Monthan AFB, whose boundaries encompass 10,600 acres, or more than 16 square miles.
- As of 30 September 1997, AMARC stores 4,974 aircraft comprised of more than 50 MDS aircraft within its perimeter.
- AMARC stores 200,000 units of aircraft and aerospace tooling and associated equipment also within its acreage.

WORKFORCE - PAYROLL:

- As of fiscal year 1997, AMARC's workforce population was 641 and civilian payroll was \$28,301,387.

TRANSPORTATION ACCESS:

- The area is serviced by one major interstate highway, I-10. I-10 passes through Pima County and parallels the south-southwest border of Davis-Monthan AFB at a distance of approximately one-mile. Interstate 10 also intersects with I-19 for overland service to the Arizona/Mexico border.
- Tucson International Airport is the only major airport in the vicinity. There are also two general aviation airports.
- The Southern Pacific railroad services the Tucson area for freight haulage.
- Transportation accesses for Tucson also includes a major truck line and bus terminal.

ENVIRONMENTAL CONSTRAINTS:

- AMARC's mission is governed by Pima County, Arizona state and United States government laws concerning water, air, noise, effluent, ozone depleting chemicals, hazardous material disposal and solid waste stream pollution. The impact on AMARC's mission is minor.
- AMARC takes pride in maintaining compliance with all mandates.

4.1.2 **Commodities and Products**

Aircraft

Accessories and Components
Armament
Avionics
Engines
General Purpose
Metal Airframe
Non-Metal Airframe
Support Equipment

Automotive Equipment

Accessories and Components
Communications
Engine
Hull & Chassis

Communications/Electronics

Accessories and Components
Electronics
General Purpose
Power Plants GTE
Power Plants Recip
Radar
Shelter/Housing
Support Equipment

General Support Equipment

Accessories and Components
Electronic Test Equipment
Machine Tools
Power Plant/Generator Set GTE
Power Plant/Generator Set Recip

Missile

Accessories and Components
GTE Propulsion
Guidance System
Liquid Propulsion
Missile Frame
Payload System
Solid Propulsion
Support & Launch
Surface Command & Control

4.1.3 **Processes and Technologies**

Cleaning/Stripping

Biodegradable Detergent and Water
Glass Media Blast
Hazardous Chemicals
Hydrazine Facility
Non-Hazardous Chemicals
Plastic Media Blast
Steam
Ultrasonic
Vapor Degreaser
Water Jet (Hi Pressure)
Water Jet (BOSS)

Fabrication/Repair

Air Conditioning - Freon
Certified Soldering
Coaxial Cable
Coaxial Cable - Flexible
Cutting - Abrasive
Cutting - Oxyfuel
Cutting - Plasma
Electronic ATE
Forming/Machining/Milling
Heat Treating
Hydraulic Components
Machining - Drill Press
Machining - Lathe
Machining - Milling
Metal Finishing
Metrological
Printed Circuit Board
Sheetmetal
Test Set - Manual
Tool and Die
Welding
Welding - Arc
Welding - Plasma
Welding - TIG, MIG
Wiring Harness

Test and Inspection

Air/Fuel Flow
Aircraft Rigging
Azimuth Alignment
Bonding Test
Calibration
Eddy Current
Electro Static Discharge
Electronic ATE
Electronic ATE - Analog
Electronic ATE - Digital
Electrostatic Discharge
Engine Test Cell - Manual
Fluorescent Penetrant - Manual
Hydraulic Systems
Hydrostatic
Leak Test
Load Test
Long Term Storage Test
Magnetic Particle
NDI Magnetic Particle
Retirement for Cause
Ultrasonic - Manual
Video Inspection Probe
X-Ray - Film
X-Ray - Real Time

Other

Batteries
Crating
Deactivation
Demilitarization
Freon Reclamation
Packaging
Preservation
Reclamation
Spray Pain
Storage

4.2 Ogden Air Logistics Center (OO-ALC), Hill AFB, Utah

4.2.1 OVERVIEW

HISTORY:

- The genesis for Ogden Air Logistics Center was the Wilson-Wilcox Bill (Public Law 26) which provided for the addition of new permanent Air Corps stations and depots in August 1935.
- A supplemental Military Appropriation Act of 1 July 1939, authorized Ogden Air Depot, which was renamed Hill Field on 1 December 1939, in recognition of Major Ployer P. Hill, who lost his life on 30 October 1935, while testing the prototype B-17 "Flying Fortress".
- Construction began in 1940 and by 1941 maintenance began on A-20s and Lockheed Hudsons. B-24 maintenance was added on 14 February 1943.
- During World War II, the name, Ogden Air Depot, changed to Ogden Air Service Command, then Ogden Air Technical Service Command, and finally on 22 July 1946, it became Ogden Air Material Area (OOAMA). During this period, A-20, B-17, B-24, B-29, P-40 and P-61 aircraft were repaired and overhauled.
- The US Air Force came into being on 18 September 1947, with the passage of the Armed Forces Unification Act on 5 February 1948. Hill Field was renamed Hill Air Force Base. Work on F-84 and F-89 aircraft began in 1953. The Ogden Arsenal transferred from the Army to Hill Air Force Base on 1 April 1955.
- With completion of a new runway in 1957, OOAMA began maintenance of RF-101 and F-102 aircraft. The OOAMA also began missile maintenance in 1957 with assignment of the BOMARC supersonic interceptor missile. Assignment of the MINUTEMAN intercontinental ballistic missile followed in January 1959, and the LGM-25 TITAN II missile in 1965.
- F-4 aircraft maintenance began 9 January 1962. The OOAMA was renamed the Ogden Air Logistics Center (OO-ALC) on 1 April 1974. In 1975, the MX PEACEKEEPER intercontinental ballistic missile was added to OO-ALC's responsibilities followed by the F-16 multinational fighter aircraft in Dec 1976.
- C-130 maintenance was directed in FY88.

MISSION: Ogden Air Logistics Center provides worldwide logistics management, engineering, modification and depot maintenance for the F-16 Fighting Falcon aircraft. This includes providing logistics support to 19 countries and more than 3,900 F-16 aircraft. OO-ALC also provides Programmed Depot Maintenance on the C-130 Hercules, logistics management for the F-4 aircraft, including support to eight countries, and is the repair source and logistics manager for the nation's silo-based intercontinental ballistic missiles, including the Minuteman and Peacekeeper. OO-ALC operates the largest overhaul facility for aircraft landing gear, wheels and brakes, as well as a state-of-the-art composite repair facility. Items overhauled include rocker motors, air munitions, guided bombs, photonic imaging and reconnaissance equipment, simulators and training devices, avionics, instruments, hydraulics, pneudraulics, special purpose vehicles, shelters, and other related components. In addition, OO-ALC has a premier software development, test, maintenance

and consultation capacity with a Level 5 Capability Maturity Model (CMM) rating. Principal end items maintained by OO-ALC are:

- Aircraft1
 - F-16 Fighting Falcon
 - C-130 Hercules
- Missiles
 - LGM-30 Minuteman
 - LG-118A Peacekeeper

In addition to the above, OO-ALC will assume responsibility for other weapon systems and equipment in the 1999-2001 time frame as a result of BRAC decisions to close other Air Force depots. Included will be mature aircraft, A-10, F-111, reentry vehicles, nuclear weapons, power equipment systems, and a host of space command and control systems.

OO-ALC is the (proposed) Office of Secretary of Defense designated Center for Industrial and technical Excellence for the following areas:

Weapons	Instruments
Air-munitions	- Pressure, Temperature, Humidity
- Electro/Mechanical SE	- Electro/Mechanical
Missile and Space Launch Vehicle	- Flight Control
- Components, Launch control	- Gyros
Hydraulics/Pneudraulics	- Displacement & Ring Gyros
- Refrigeration/Heating Systems	- Compass
- Ram Air Turbines	- Navigational
- Fluid Driven Accessories	- Inertial Measurement Unit Platforms
- Missile Control Hydraulics	- Multi-function Displays
Nuclear Components	Composite/Plastic Components (Mfg)
Shelters	F-16
- Rigid Wall and Portable	A-10
Landing Gear	Printed Wiring Boards (Mfg)
Photonics	Foundry
Training and Simulation Equipment	- Investment Casting
Strategic Missiles	Engines
	- Non-Propulsion

LOCATION:

- Centrally located in the western United States within the northern population center of the State of Utah.
- Approximately 30 miles north of Salt Lake City and 15 miles south of Ogden via Interstate 15.
- Situated at 4,800 feet above sea level in a semi-arid region having four distinct seasons.

SIZE:**1. Total -**

- 962,132 acres of land
- 1,542 buildings with 14.2 million square feet of space
- Facility replacement value \$4.7B
- Plant equipment value \$430M

2. By area -

- Area A: Hill AFB consists of 6,683 acres with 1,375 buildings, of which 229 are industrial containing 4 million square feet.
- Area B: Utah Test and Training Range (UTTR), located approximately 90 miles west of the base, consists of 953,887 acres with 122 buildings, of which 45 are industrial with 234,261 square feet.
- Area C: Survivability & Vulnerability Integration Center, located 220 miles Northwest of the base, has 740 acres with 15 buildings, of which 5 are industrial with 2,902 square feet.

WORK FORCE/PAYROLL:

- 20,000 people worked at Hill AFB in FY98
 - OO-ALC: 7,411 civilians, 2,074 military
 - Contractors: 4,671
 - Reservists: 1,195
 - Tenants: 2,360 civilians, 2,354 military
- Annual Payroll of over \$500 million
- Up to an additional 2,000 employees are anticipated in the 1999-2001 time frame due to transitional workloads from other closing AF depots.

TRANSPORTATION ACCESS:

- Hill AFB has a 13,500-foot runway with over 40,000 annual takeoffs and landings.
- There are 232 miles of on-base roadway and 25 miles of railway.
- Two major highways (I-15 north-south, I-80 east-west) intersect near the depot (30 Miles)
- One major commercial/international airport is located in Salt Lake City (30 Miles)
- Railroad service runs onto the base.

ENVIRONMENTAL PROGRAMS:

Hill AFB has a strong environmental program. An Environmental Management (EM) Directorate was established in October 1988 to oversee environmental requirements. However, emphasis is continually made that compliance and pollution prevention is integral parts of every industrial job on the base. The EM staff is comprised of engineers, scientist and environmental specialists. Their focus is to ensure that the base is able to continue meeting its mission while also complying with environmental laws, protecting resources, and reducing reliance on hazardous materials. The state and local environmental laws affecting Hill AFB are based on the corresponding federal laws. Since Hill AFB is in an area that did not meet ozone standards until recently, considerable emphasis is placed on air quality by both EM and state regulators. Over 95 percent of the paints used on base are low VOC varieties and all of the base vehicle fleet is subjected to annual emissions testing. Hill AFB is a major source under Title V of the Clean Air Act Amendments. Industrial wastewater is pretreated on base before being discharged to a publicly owned treatment plant. The on-base treatment is designed to remove heavy metals, treat cyanide waste, and remove organics prior to discharge. Storm water runoff is collected in retention ponds to control non-point-source pollutant discharges. Also to help reduce the potential off-base impact from spills, secondary containment is required for all hazardous material storage areas. Hazardous materials are tracked and monitored to help reduce worker exposure and to provide information to reduce waste and emissions at the starting point. All organizations on base are tied to the Hazardous Material Management System to automate the tracking of quantities and properties of materials being used. Because of reductions and controls that have been implemented, Hill AFB has the capacity to accept significant new workloads without fear of exceeding regulatory limits.

4.2.2 PLANNED TECHNOLOGICAL ENHANCEMENTS

MANUFACTURING TECHNIQUES/PROCESSES

- High temperature autoclaves for advanced composites

REPAIR TECHNIQUES/PROCESSES

- Multi-use centrifuge
- Vibration facility for explosive components
- Mobile Electro-Magnetic Pulse shield effectiveness testing
- Radiac test facility
- Shearography for composites nondestructive testing
- Enhanced computed tomography
- High velocity oxygen fueled thermal spray
- Medium aircraft plastic media blast facility
- Enhanced aircraft wiring tester
- Power paint application
- Enhanced laser automated decoating system

4.2.3 **Commodities and Products**

Aircraft

Accessories and Components
Armament
Avionics
Engines
General Purpose
Metal Airframe
Non-metal Airframe
Support Equipment

Automotive Equipment

Accessories and Components
Communications
Electronics
Engine
Hull & Chassis
Support Equipment

Combat Vehicles

Armament
Communications
Fire Control
General Purpose
Power Plants
Support Equipment

Communications/Electronics

Accessories and Components
Electronics
General Purpose
Power Plants GTE
Power Plants Recip
Radar
Shelter/Housing
Support Equipment

General Support Equipment

Accessories and Components
Electronic Test Equipment
Machine Tools
Power Plant/Generator Set GTE
Power Plant/Generator Set Recip
Topographic
Troop Support Equipment
Rail Equipment

Missile

Accessories and Components
GTE Propulsion
Guidance System
Liquid Propulsion
Missile Frame
Payload System
Solid Propulsion
Support & Launch
Surface Command & Control

Ordnance

Conventional Arms & Explosives
Small Arms

4.2.4 **Processes and Technologies**

Cleaning/Stripping

Abrasive Flow
Agricultural Media Blast
Biodegradable Detergent and Water
CO2 Blast
Glass Media Blast
Grit Blast
Hazardous Chemicals
Hydrazine Facility
Non-Hazardous Chemicals
Plastic Media Blast
Sand Blast
Solusonic Detergents
Steam
Ultrasonic
Vapor Degreaser
Vibratory Finishing
Water Jet

Fabrication/Repair

Advanced Composites
Air Conditioning
Air Conditioning - Freon
Autoclave Large
Autoclave Small
Blade/Vane
CAD/CAM
- Artwork-Flat Wire Cables
- Artwork-Printed Circuit Board
- CNC & NC Programming
- Drilling/Lathe/Punch
- Engineering Analysis
- Engineering Design/Drawings
- Forming/Machining/Milling
- Optical Elements
- Printed Circuit Board
- Sheetmetal
- Vertical Internal Grinder
Ceramics

Fabrication/Repair

Certified Soldering
Chemical Forming/Machining/Milling
Class 10,000, 100,000 Clean Room
CNC & NC Programming
CNC Forming/Machining/Milling
Coaxial Cable
Coaxial Cable - Flexible
Coaxial Cable - Rigid
Coaxial Cable - Rigid/Phase Matched
Coaxial Cable - Semi-Rigid
Coaxial Cable - Semi-Rigid/Phase Matched
Computers
Cryptographic
Cutting - Laser
Cutting - Oxyfuel
Cutting - Plasma
Electromechanical Actuators
Electronic ATE
EPROM/Prom Programming
Fiber Optics
Flame Spray
Flexible Machining Cell
Forming/Machining/Milling
Foundry - Ferrous
Foundry - Non-ferrous
Heat Treating
High Pressure Pumps - 3000 lbs.
Hybrid Microcircuit
Hydraulic Actuators
Hydraulic Servo Cylinders
Hydrazine Facility
Investment Casting
Isostatic Press
ITA Housings
Ivadizer
Laser Center
Laser Punch
Laser Static Balance
Machining - Drill Press

Fabrication/Repair

Machining - Lathe
Machining - Milling
Machining - Trace Milling
Metal Finishing
Metrological
Molds
Optics
Phosandodize
Photo Etching
Plasma Spray
Plastic Injection
Plating - Cadmium
Plating - Cadmium/Gold
Plating - Chromium
Plating - Gold
Plating - Nickel
Plating - Nickel/Boron
Plating - Nickel/Chromium
Plating - Silver
Plating - Silver/Copper
Plating - Tin/Lead
Plating/Printed Circuit Board - Copper
Plating/Printed Circuit Board - Nickel
Plating/Printed Circuit Board - Tin/Lead
Precision Balancing
Printed Circuit Board
RF Screen Room
Robotic Auto Cleaning System
Robotic CARC Painting
Robotic Grinding
Robotic Metal Spray
Robotic Metalizing
Robotic Painting
Robotic Plasma Spray - Conventional
Robotic Plasma Spray - Low Pressure
Robotic Plastic Media Blast
Robotic Polishing
Robotic Propellant Cutting
Robotic Sand Blast
Robotic Welding
Rubber Products

Fabrication/Repair

Sheetmetal
Software - Application TPS
Software - ATE Operating System
Software - Multiple Languages
Software - Multiple Programs
Software - OFP
Test Program Sets
Test Sets - Automatic
Test Sets - Manual
Tool and Die
VSIC Circuits
Welding
Welding - Acetylene/Oxygen
Welding - Arc
Welding - Certified Ballistic
Welding - Dabber TIG
Welding - Electron Beam
Welding - Plasma
Welding - TIG, MIG
Wiring Harness

Test and Inspection

Air/Fuel Flow
Aircraft Rigging
All Up Round-BIT
Anechoic Antenna Test Chamber
Antenna Test Range
ATE - RF
ATE - Video
Auto-Optical PCB
Bearing Process
Bonding Test
Bonding Test (Integrated Circuits)
Burn-In
Calibration
Cold Proof
Dynamometer
Dynamometer - Chassis
Dynamometer - Engine
Dynamometer - Hydraulic Motor

Test and Inspection

Dynamometer - Transmission
Eddy Current
Electron Microscope
Electron Microscope/EBIC
Electronic ATE
Electronic ATE - Analog
Electronic ATE - Analog (RF)
Electronic ATE - DATSA
Electronic ATE - Digital
Electronic ATE - Digital (RF)
Electronic ATE - Ditmco
Electronic ATE - General Hybrid
Electronic ATE - GenRad
Electronic ATE - Microwave
Electrostatic Discharge
Engine Test Cell - Automated
Engine Test Cell - Calibration
Engine Test Cell - Kemen
Engine Test Cell - Manual
Environmental Stress Screening
Environmental Vibration
Fiber Optics
Fluorescent Penetrant - Automated
Fluorescent Penetrant - Manual
Hush House
Hydraulic Flow & Pressure
Hydraulic Systems
Hydrostatic
Integrated Blade/Vane Systems
Laser Measuring
Laser Test Range
Leak Test
Load Test
Long Term Storage Test
Magnetic Particle
Microwave Component Test
Missile Flight Control Unit - Actuators
Missile Flight Control Unit - Injectors
Missile Flight Control Unit - Pumps
NDI Magnetic Particle
Radiation Shielding

Test and Inspection

Radiography - Computed Thermography
Radiography - Gamma
Spectrographic Analysis
Stress
Stress - Centrifuge
Stress - ESS
Stress - Temperature Cycle
Tempest Test
Thermography
Type II Calibration Laboratory
Type II Calibration Laboratory/PMEL
Ultrasonic - Automated
Ultrasonic - Manual
Vibration - Random
Vibration - Sinusoidal
Vibration - Sinusoidal - 4 Axis
Video Inspection Probe
X-Ray - Computed Tomography
X-Ray - Film
X-Ray - Real Time

4.3 Oklahoma City Air Logistics Center (OC-ALC), Tinker AFB, Oklahoma

4.3.1 OVERVIEW

HISTORY:

- On 8 April 1941, an order was officially signed awarding depot project to Oklahoma City.
- In 1942 the installation was named Tinker Field in honor of Major General Clarence L. Tinker.
- Tinker's industrial plant repaired B-17 and B-24 bombers and engines, and fitted B-29s for combat during World War II. In 1946 Tinker expanded to include the Douglas Aircraft Plant and was named Oklahoma City Air Materiel Area.
- The fifties were noted for base expansion and new management responsibilities. OCAMA took complete system management of the B-52 bomber and the KC-135 tanker. In 1958, hundreds of B-47s flew in for wing modifications.
- In 1974 the depot was renamed Oklahoma City Air Logistics Center (OC-ALC).
- In 1992 Navy Strategic Communications Wing (STRATCOMMWING) ONE became operational at Tinker forming a unique and integrated partnership that is a model of Interservicing.

MISSION:

- Acquire and sustain the world's best aviation systems in partnership with our customers and suppliers.
- OC-ALC provides worldwide logistics support for a variety of weapons systems, including B-1B, B-2, B-52, E-3, multi-purpose C-135 series, Air Launched Cruise Missile (ALCM), Conventional Air Launched Cruise Missile (CALCM), Air Force Harpoon, Short Range Attack Missile (SRAM) and the Advanced Cruise Missile (ACM) weapons systems.
- Navy Strategic Communications Wing (STRATCOMMWING) ONE is based at OC-ALC allowing for depot support of the E-6 aircraft. Commonality between the E-6 and E-3 airframes facilitates maximum utilization of depot support functions already in place.
- OC-ALC manages all 30 mission designs of contractor logistics support (CLC) aircraft including the C-9, VC-25, E-4, KC-10, C-26, C-20 and C-12 aircraft of the Air Force. Army and other military services and non-military agencies.
- OC-ALC manages 15 models of gas turbine engines used in fixed wing aircraft, helicopters, and cruise missiles. The center is Source of Repair (SOR) for 9 of the 15.
- Currently repairing the TF33, F101, F107, F108, F110, F112 and F118 engines.
- SOR for the Navy's F110-400, TF30-414A, and CFM56-2A engines.
- Only SOR accomplishing overhaul/testing of F107 and F112 cruise missile engines. Depot functions are accomplished in a single facility that is capable of repair/overhaul of Navy F107-400 engines.
- Technology Repair Center (TRC) for hydraulics/pneumatics, oxygen/other gas generating equipment, instruments, B-1B offensive avionics systems, and engine related exchangeable. Center managed approximately 44,000 accessory items and repaired approximately 300,000 exchangeable.

NOTE 1: Source of mission critical software engineering for OC-ALC automated depot repair process and management of assigned weapon systems. Categories of software include: Test Program Sets, Operational Flight Programs, and Industrial Automation.

LOCATION:

- Central United States. Southeastern corner of the Oklahoma City metropolitan area.
- South of Interstate 40
- North of Interstate 240
- 5 Miles east of Interstate 35

SIZE:

- 5,041 Acres
- 752 buildings
- 15.5M square feet of floor space
- \$669M estimated replacement value of DMAG Capital Equipment.

WORK FORCE/PAYROLL (As of 30 Sep 96):

- 12,765 Civilians
- 8,017 Military
- \$806.5M Payroll
- OC-ALC has identified the following Government Owned/Contractor operated (GOCO) facilities:
 - The B-2 WSSC located in Bldg. 1083. The contractor maintains software for the B-2 Operational Flight Program. Facility achieved IOC 15 Aug 98. FOC is planned for FY01.
 - A support equipment facility is located in Bldg. 2120

TRANSPORTATION ACCESS:

- Truck: Installation is accessible by four major highways from six directions.

North and South	Interstate 35
East and West	Interstate 40
Northeast	Turner Turnpike (I-44)
Southwest	HE Bailey Turnpike
South	Interstate 240

- Air: one major commercial airport and four small craft airports serve the installation.

ENVIRONMENTAL PROGRAMS

- Part of Tinker AFB was placed on the National Priorities List (NPL) in 1987. A Federal Facilities Compliance Agreement (FFCA) was signed in 1988. There are ongoing investigations and actions to remedial contamination of soil and groundwater from past operations at Tinker AFB.
- Tinker is located over the Garber-Wellington aquifer and is a major part of the aquifer recharge zone. Tinker AFB has taken significant measures to ensure that no hazardous chemicals are released into the aquifer.
- Diluted industrial wastewater is pre-treated prior to being piped to the Oklahoma City Owned Treatment Works (PTOW). The pre-treatment operations are treating the diluted waste to comply with limits established by Oklahoma City. Sanitary waste is also piped to Oklahoma City for treatment.

Environmental Constraints:

Each of the federal environmental laws has corresponding state and local laws and other regulatory requirements that impact the depot. The following is a list of federal environmental regulations that affect our depot:

- National Environmental Policy Act (NEPA).
- Federal Facilities Compliance Act (FFCA).
- Solid Waste Disposal Act (SWDA).
- Clean Water Act (CWA).
- Clean Air Act (CAA) and Amendments (CAAA).
- Resource Conservation and Recovery Act (RCRA).
- Comprehensive Environmental Response, Compensation and Liability Act (CERCLA).
- Superfund Amendments and Reauthorization Act (SARA).
- Toxic Substances Control Act (TSCA).
- Emergency Planning and Community Right-to-Know Act (EPCRA).
- Atomic Energy Act.
- Historic Preservation Act.
- Noise Control Act.

- Safe Drinking Water Act.
- Federal Insecticide, Fungicide, and Rodenticide Act.
- 10 Code of Federal Regulations (Limited sections apply).
- 40 Code of Federal Regulations (Limited sections apply).
- 49 Code of Federal Regulations (Limited sections apply).
- 50 Code of Federal Regulations (Limited sections apply)

Environmental factors do not represent a major constraint to base capacity or expansion capability.

Environmental Management

On April 21, 1997, Tinker was presented with the Thomas D. White Environmental Quality Award for the Industrial Category. Tinker has earned more than 60 environmental awards since the inception of the Environmental Management Program.

Information and communications exchange is accomplished through various environmental working groups and integrated product teams. These groups/teams draw together aerospace system managers, production managers, engineers, and other personnel base-wide to help institutionalize environmental/safety/occupational health (ESOH) management into all areas of Tinker AFB as a preferred way of doing business. Federal, state, and local environmental laws and other regulatory requirements impact the depot operations, but do not represent a major constraint to base capacity or expansion capability.

Pollution Prevention Program

Tinker AFB continues superior performance and success in pollution reduction/prevention throughout the base operations, from flight line and depot maintenance to the solid waste disposal in family housing.

The hazardous material pharmacy controls chemical purchases, storage, and distribution on Tinker AFB. This network successfully links the chemical purchases with the requirements, uses, and disposal. This pharmacy concept has been instrumental to identify needs, establish priorities, and providing direction to our pollution reduction/prevention efforts.

Tinker AFB has practically eliminated the use of ozone depleting substances from depot maintenance and repair activities by utilizing alternative chemicals and implementing innovative technologies.

Tinker has exceeded the EPA-17 and the Toxic Release Inventory (TRI) goals for year 1999 ahead of schedule. Tinker has become the Air Force leader by introducing new prototype technologies into most aerospace maintenance processes, thereby reducing hazardous material usage and eliminating hazardous waste associated with cleaning, paint removal, electroplating, and coating operations.

Tinker is committed to implement new technology that will reduce or eliminate pollution through the use of alternative fuel sources. Tinker has more than 220 base vehicles on compressed natural gas (CNG) using over 6,000 gallons of CNG per month. Propane and electric is used in our aircraft tugs and forklifts, a noticeable improvement of emissions for material handling equipment inside buildings. Further vehicle conversions are planned along with branching into electric cars and trucks as well as other related technologies.

Major actions underway at Tinker AFB include a detailed inventory of all air emission sources and the collection of data required by the Title V permit application for the base which is due 3 March 1999, including all applicable regulatory requirements and a compliance determination of each source. Tinker has chosen to use compliant coatings and solvents in lieu of costly pollution controls to meet Aerospace NESHAP requirements.

Environmental Management has demonstrated continued environmental leadership by enhancing pollution prevention awareness through the ingenuity of partnerships and coalitions with industry, other government agencies, and academia.

Environmental Compliance Program

- Storm Water Program

Tinker is committed to preserving the quality of its surface resources and protecting base aquatic life. The primary objective of the storm water program is to prevent discharges of contaminants into the creek system. Recently the program targeted run-off from deicing operations, which is the largest single source of contamination to the base creeks. Deicing containment systems and vacuum sweepers were purchased and provided to base flying units. This equipment captures the deicing runoff before it enters the storm system; this minimizing its impact on the creeks and the associated aquatic life.

4.3.2 TECHNOLOGICAL ENHANCEMENTS

REPAIR TECHNIQUES/PROCESSES:

- **Treatability Study for Catalytic Extraction Processing (CEP)**

Tinker AFB is currently beginning a treatability study of the Catalytic Extraction Processing (CEP) waste minimization technology developed by Molter Metal Technology, Inc. and Lockheed Martin - Martin Marietta (M4). CEP is a process that is comprised of a molten metal bath, operated at temperatures above its liquid state (2,400 - 3,200 Deg F). The liquid metal acts as a catalyst and solvent in the dissociation of the feed synthesis of products resulting in significant waste volume reductions. CEP is non-incineration technology that provides superior environmental performance and does not present dioxin or other combustion emission concerns.

The project will evaluate and determine the applicability of using catalytic extraction processing for treating hazardous waste solids, sludge, liquids, and gases and rendering the

waste into a non-hazardous reusable product (90% efficient). The project shall evaluate the CEP process to determine the most effective methods for treating the hazardous waste and assess the economic benefits for establishing the CEP process at Tinker AFB. The treatability study will produce specific data to identify destruction efficiency, product production and valid uses, and the quantity and proposed disposition of non-product residues.

If the treatability study is successful, Tinker AFB will be designated as a regional center for the disposition of hazardous waste.

OC-ALC/LP operates a large industrial Plating Facility with a 40,000 SF shop area and a 35,000 SF Prep/Deprep area. The facility employs 40 Journeyman Electroplaters and processes 48,000 parts per year, each of which has individual plating requirements. Plating provides essential processes for the remanufacture and repair of jet engines and aircraft components by metal deposition and surface finishing. The shop consists of approximately 220 process tanks and eleven major processes. Plating waste is treated by a Waste Pretreatment System in the shop. A Vacuum Vapor Degreaser is in use in the Prep/Deprep area. Approximately 80% of the shop have been renovated through an FY93 MILCON project. The result of this project is a modern plating facility compliant with environmental, health and safety regulations. This project provided repair of the building infrastructure, reduction of hazard potential through alternative processes, consolidation of equipment, extended service life of the facility, and incorporation of Best Available Control Technology (BACT) environmental equipment. Concepts and innovations were incorporated to increase efficiency, control corrosion, provide maintenance access, and provide redundancy to inherently dangerous and corrosive processes.

- **Aircraft Component Subsystem (ACS)**

The ACS uses automated high-pressure water blast to remove paint from aircraft component parts. Approximately 285,000 square feet of surface area on these components were chemically stripped by OC-ALC in a typical year. This is equivalent to total painted surfaces of 28 C/KC-135s. The largest part stripped in the ACS's 20 feet by 50 feet workcell is the B-52 inboard flap at 31 feet 6 inches long by 8 feet 6 inches high. The system provides environmentally safe coating removal at stripping rates of 125 square feet/hour, with no damage to the aircraft components and no hazards to ALC personnel. The ACS went into production status February 1995.

- **Confined Space Monitoring System (LIFE LINE)**

Life Line is a computerized communications system to improve monitoring of workers in confined areas, including fuel tanks, compartments, and other confining, potentially hazardous locations. The system consists of eight satellite console units, one portable satellite console, 100 portable communication devices, 20 gas monitors, and one central console. The eight satellite units, dispersed throughout depot aircraft maintenance facilities, are connected by data and communications lines to the central console in the Aircraft Control Center. To use the system, a technician is issued a portable communication device

before entering a confined space “out of sight” workplace. On regular intervals, the system’s main computer sends out a signal to the worker requesting a response. If there is no response, the computer notifies a sentry who then attempts confirmation of the situation prior to notifying rescue personnel. The user may also initiate a rescue by pressing the panic button on top of the radio unit. LifeLine will be operational in October 1997.

- **Corrosion Control Capability Program**

OC-ALC’s new 52,000 square foot hangar (now under construction) will provide a functional and environmentally safe facility for aircraft paint application. The facility will incorporate the most modern paint processes and filtration systems compliant with the national Emissions Standards for Hazardous Air Pollutants (NESHAP) and has the capability for painting B-1B, E-3, C/KC-135, and E-6 aircraft. Planned operational date is March 1999.

- **Fuel Leak Detection Device (Small Business Innovation Research - (SBIR) Project**

The concept of this project is to find a way to “see” a gas or vapor leaking from a fuel tank. The visualization method requires the use of an infrared detection device (much the same as night vision glasses) that detects the escaping gas and conditions the resulting signal so it can be viewed through a visor or on a video monitor. Two companies completed Phase I of the project that is to develop a device that works in a laboratory setting (proof of concept). One research company is currently in Phase II (prototype) development). From Phase II, we will receive a working model along with a design that is suitable for mass production. Estimated completion/implementation of prototype system is FY-00/2.

- **Corrosion Control DePaint Capability Program**

OC-ALC/s proposed 54,000 square feet hanger would provide a functional and environmentally safe paint strip bay. The facility incorporates up-to-date strip processes that are compliant with the National Emission Standards for Hazardous Air Pollutants (NESHAP). The proposed facility will be operational in December 2002 and capable of depainting B-1, B-52, E-3, E-6, and C/KC-135 aircraft with environmentally compliant and effective processes.

- **Electronic Pulse Surveillance Low-Level Continuous Wave Facility**

The low-level Continuous Wave Facility is located at the Old Compass Rose Site. The facility is used to measure changes in weapon system configuration, which affect the weapon system's ability to withstand electronic pulse. The facility includes a 1600 square foot building and an elliptic antenna. The building houses the Hardness Evaluation System that drives the elliptic antenna and records, and processes the test data.

OTHER PLANNED TECHNOLOGICAL ENHANCEMENTS

- Flexible manufacturing system.
- Reverse machining center.
- Automated compressor and turbine blade measurement.
- Rejuvenation of rotating engine components.
- Automated molydag system.
- Assembly verification stands.
- Computerized control for heat treat.
- Vacuum Vapor Degreaser

SIGNIFICANT EXISTING/CURRENT CAPABILITIES

- **Consolidated Fuel Controls Test Facility**

The consolidated fuel controls test facility (91,695 square feet, \$14.45 million) is designed to test and calibrate fuel system components (fuel controls, pumps, valves, actuators, filters, flow transmitters) for aircraft engines and was brought on-line in February 1995. The new facility is the automated counterpart of an existing 51-year old facility, and its design incorporates state-of-the-art safety features and the latest in automated generic test stations. Over 40 fuel system test stands capable of testing several different items will be located in this building. The concept provides for flexible testing capability, energy savings, high quality components, and reduced reliance on high-cost peculiar test equipment. Over 24,000 fuel system components will be tested each year.

This new test facility has been designed with the ability to expand and receive additional workload and is readily adaptable for any jet engine fuel system component testing. The facility has an activated charcoal filtration system that eliminates 95 percent of calibration fluid (test fluid substitute) vapor emissions and 9 tons of volatile organic compound

emissions each year. The recovery system reduces consumption of calibration fluid by 67 percent (140,000 gallons per year).

A \$12.7 million Productivity Investment Fund (PIF) project will provide an Advanced Fuel Accessories Test System (AFATS) for the new facility. The automated generic test stations will eliminate the high cost of low usage peculiar support equipment. The AFATS reduces the number of required test stands by 3 to 1 and incorporates the most advanced technology on automated test equipment architecture, testing, maintainability, and facility efficiency utilization. The AFATS will be capable of automatically testing the various fuel accessories under preprogrammed computer control and is designed for maximum flexibility and expandability. Other benefits realized by the AFATS will include: 22 percent productivity increase (\$20,000 per station per year); 53 percent energy savings per AFATS station (\$9,000 per station per year); adaptability to future weapon systems with only test program set development; and reduction of required number of test stands.

4.3.3 **Commodities and Products**

Aircraft

Accessories and Components
Armament
Avionics
Engines
General Purpose
Metal Airframe
Non-metal Airframe
Support Equipment

Automotive Equipment

Engine

Communications/Electronics

Accessories and Components
Electronics
General Purpose
Power Plants GTE
Power Plants Recip
Radar
Shelter/Housing
Support Equipment

General Support Equipment

Accessories and Components
Electronic Test Equipment
Heating & Air Conditioning
Machine Tools
Power Plant/Generator Set GTE
Power Plant/Generator Set Recip
Rail Equipment - Rolling Stock
Topographic
Troop Support Equipment

Missile

GTE Propulsion
Solid Propulsion

Ordnance

Conventional Arms & Explosives

4.3.4 **Processes and Technologies**

Cleaning/Stripping

Abrasive Flow
Agricultural Media Blast
Aqueous - Hot Water
Bicarbonate of Soda Stripping (BOSS)
Biodegradable Detergent and Water
CO2 Blast
Glass Media Blast
Grit Blast
Hazardous Chemicals
High Pressure Water
Medium Pressure Water
Molten Salt Furnace
Non-Hazardous Chemicals
Plastic Media Blast
Robotic Water Jet
Selective Paint Stripping
Steam
Ultrasonic
Vapor Degreaser
Vibratory Finishing
Water Blast - BOSS
Water Jet (Aqua Miser)

Fabrication/Repair

Activated Diffusion Heating (ADH)
Advanced Composites
Air Conditioning - Freon
Air Conditioning - Lithium Bromide
Autoclave Large
Autoclave Small
Blade/Vane
CAD/CAM
- Artwork-Printed Circuit Board
- CNC & NC Programming
- Drilling/Lathe/Punch
- Engineering Analysis
- Engineering Design/Drawings
- Forming/Machining/Milling
- Printed Circuit Board
- Sheetmetal

Fabrication/Repair

Ceramics
Certified Soldering
Chemical Forming/Machining/Milling
Class 100,000 Clean Room
CNC & NC Programming
CNC Forming/Machining/Milling
Coaxial Cable
Coaxial Cable - Flexible
Coaxial Cable - Rigid
Coaxial Cable - Rigid/Phase Matched
Coaxial Cable - Semi-Rigid
Computerized Stencil/Decal Preparation
Cutting - Abrasive
Cutting - Laser
Cutting - Oxyfuel
Cutting - Plasma
Dynamic Balance
Electromagnetic Pulse Surveillance
Electronic ATE
EPROM/Prom Programming
Flame Spray
Flexible Machining Cell
Fluid Cell Press
Forming/Machining/Milling
Foundry - Ferrous
Foundry - Non-ferrous
Furnace Brazing
Heat Treating
Hybrid Microcircuit
Hydrostatic
Investment Casting
Isostatic Press
Ivadizer
Jet Kote Hypersonic
Laser Center
Laser Dynamic Balance
Laser Punch
Laser Punch/Drill
Laser Static Balance
Laser Welding
Lathe - CNC

Fabrication/Repair

Machining Center - 5 Axis
Metal Finishing
Metrological
Optics
Phosandodize
Photo Etching
Plasma Spray
Plating - Cadmium
Plating - Cadmium/Chromium
Plating - Chromium
Plating - Electro
Plating - Electroless Nickel
Plating - Gold
Plating - Gold/Silver
Plating - Hard Chrome
Plating - Nickel
Plating - Nickel/Boron
Plating - Silver
Plating - Tin/Lead
Precision Balancing
Printed Circuit Board
Robotic Auto Cleaning System
Robotic Blade Weight
Robotic Grinding
Robotic Metal Spray
Robotic Metalizing
Robotic Painting
Robotic Plasma Spray - Conventional
Robotic Plasma Spray - Hi Vel. Oxygen
Robotic Plasma Spray - Low Pressure
Robotic Plastic Media Blast
Robotic Sand Blast
Robotic Welding
Rubber Products
Sheetmetal
Software - Applications TPS
Software - ATE Operating System
Software - Multiple Languages
Software - Multiple Programs
Software - OFP
Test Program Sets
Tool and Die

Fabrication/Repair

Welding - Arc
Welding - Dabber TIG
Welding - Electron Beam
Welding - Laser
Welding - Plasma
Welding - TIG, MIG
Wiring Harness

Test and Inspection

Air/Fuel Flow
Aircraft Rigging
Anechoic Antenna Test Chamber
Antenna Test Range
Auto Prompting
Bearing Process
Bonding Test
Calibration
Cold Proof
Coordinate Measuring Machine (CMM)
Dynamometer - Hydraulic Motor
Dynamometer - Transmission
Eddy Current
Electromagnetic Pulse PM Testing
Electromagnetic Pulse Surveillance
Electron Microscope
Electronic ATE
Electronic ATE - Analog
Electronic ATE - Analog (RF)
Electronic ATE - DATSA
Electronic ATE - Digital
Electronic ATE - Digital (RF)
Electronic ATE - Ditmco
Electronic ATE - GenRad
Electronic ATE - Microwave
Electronic ATE - Teradyne
Electrostatic Discharge
Engine test Cell - Automated
Engine Test Cell - Calibration
Engine Test Cell - Manual
Environmental Stress Screening
Environmental Vibration
Fiber Optics

Test and Inspection

Fluorescent Penetrant - Automated
Fluorescent Penetrant - Manual
Hush House
Hydraulic Systems
Hydrostatic
Integrated Blade/Vane Systems
Laser Measuring
Leak Test
Load Test
Magnetic Particle
Microwave Component Test
NDI Magnetic Particle
Optical
Parametric Semiconductor
Radiography - Gamma
Radiography - Neutron
Retirement for Cause
Spectrographic Analysis
Stress
Stress - ESS
Stress - Temperature Cycle
Type II Calibration Laboratory
Type II Calibration Laboratory/PMEL
Ultrasonic - Automated
Ultrasonic - Manual
Vibration Testing
Video Inspection Probe
X-Ray - 3D
X-Ray - Computed Tomography
X-Ray - Film

Chemical Laboratory

- Process Monitoring (Plating/Cleaning)
- Organic Analysis (Infrared/Gas Chrom)
- Metal ID (X-Ray & Spectrographic)

Materials Laboratory - Material Testing

QVC - Dimensional Measurement

Engineering Laboratory

- Hydraulic Testing
- Corrosion Testing
- Vibration
- Pneumatics
- Structural Integrity

4.4 Warner Robins Air Logistics Center (WR-ALC), Robins AFB, Georgia

4.4.1 OVERVIEW

HISTORY:

- In early 1941, the City of Macon and Bibb County floated \$100,000 in bonds and purchased and donated 3000 acres of land to the federal government.
- The gift of land to the government was to influence the Army Air Corps to establish a maintenance and supply depot in the area.
- During the defense build-up preceding World War II, the middle Georgia area was chosen for the maintenance/supply depot primarily because of its level land and abundant pure water.

MISSION: The logistics operations performed at WR-ALC are extremely diverse and highly integrated, and the logistics mission includes worldwide weapon system management and engineering responsibility for the following:

Special Operations Forces (SOF) Aircraft	F-15 Eagle
Air Force Helicopters	C-130 Hercules
Airborne Electronic Warfare Equipment	C-141 Starlifter
Avionics Equipment (most)	C-5 Galaxy
Vehicles (most)	U-2 Dragon Lady
Airborne Segment of Global Positioning System (GPS)	
Joint Surveillance Target Attack Radar System (JSTARS)	
Tactical Missiles (Most)	

WR-ALC manages the C-141 aircraft and is the system program office (SPO) and system program director (SPD) for the C-130 and F-15 aircraft. Some of the other logistics operations performed at Robins include repair and modification of most of the systems managed including:

F-15 Eagle	SOF aircraft
C-130 Hercules	Electronic Warfare Systems
C-141 Starlifter	Avionics
C-5 Galaxy	Propellers

WR-ALC produced 95 F-15s, 32 C-130s and 63 C-141s during FY97. In addition, they also produced approximately 52,491 exchangeable items during the same period and 920,794 hours in software development,

WR-ALC is the main operating base for the E-8 Joint STARS and is the home base for the following tenants.

- Georgia Air National Guard 116th Bomb Wing, flying the B-1 Bomber
- 19th Air Refueling Group
- Air Force Reserve Command Headquarters
- 5th Combat Communications Group
- 40 other hosted units from Air Combat Command, Air Force Materiel Command, Air Force Special Operations Command, Defense Logistics Agency, U.S. Air Force Headquarters, Federal Aviation Administration, and others.

LOCATION:

- Geographically located near the center of the state of Georgia
- Approximately 100 miles south of Atlanta, 15 miles south of Macon and adjacent to the city of Warner Robins.

SIZE:

- Situated on 8,800 acres of land, Robins AFB is the largest industrial complex in Georgia and the only large DOD aircraft maintenance facility east of the Mississippi River.
- The base has 14,290,947 total square feet of facilities and 1414 buildings (including family housing).
- Replacement cost of Robins facilities is over \$3.6B.
- Accountable equipment is valued at \$864M with \$610M used in depot maintenance production.

WORKFORCE/PAYROLL:

- Robins AFB workforce totaled 19,650 as of March 1998 (consisting of 4,939 military and 12,071 civilian employees, including tenants, and 2,640 contract civilians).
- The annual payroll at Robins is approximately \$805.1M (including \$73.8M for tenants) as of March 1998.

TRANSPORTATION ACCESS:

- WR-ALC is located at the crossroads of two major inter-states, I-75 and I-16.
- Other major highways in close proximity are Georgia highways 96, 247, 41.
- WR-ALC is a major Air Logistics Center with a transcontinental rail line and military airlift facilities that can accommodate the largest military, civilian transport and space transport aircraft.
- WR-ALC hosts the 19th Air Refueling Group with the KC-135R Stratotanker aerial refuelers.

ENVIRONMENTAL PROGRAMS: The Environmental Management Directorate was established at WR-ALC to ensure compliance with federal, state and local environmental regulations. This organization is made up of three divisions - Compliance and Restoration Division, Pollution Prevention Division, and Environmental Resources Division. The objectives of the environmental program are to promote pollution prevention as an integral part of the mission, prudently clean up the pollution created by the past, assure that all aspects of the environmental program remain in full compliance with all regulatory requirements and protect and manage our natural resources through sound conservation practices.

Robins AFB is situated on 8,800 acres of upper coastal plain, of which 2,250 acres are natural wetlands and 600 acres are mixed hardwood and pine forests. Wildlife and vegetation are diverse and abundant, ranging from the American alligator and water tupelo to the indigo bunting and longleaf pine. Artifacts, some dating back to 8000 BC, recovered from 35 archaeological sites indicate that Robins was once a major Native American settlement.

The WR-ALC/EM Directorate won the following awards in 1997:

- DOD Pollution Prevention Award (Industrial Category)
- DOD Recycling Award (Industrial Category)
- AF General Thomas D. White Environmental Quality Award (Industrial Category)
- AF General Thomas D. White Natural Resources Management Award (Small Base Category)
- AF General Thomas D. White Pollution Prevention Award (Industrial Category)
- AF General Thomas D. White Recycling Award (Industrial Category)
- 4th Quarter AF Five-Star Web Site Award
- Tree City USA Designation
- Environmental Excellence Restoration Advisory Board Recognition Award

4.4.2 TECHNOLOGY ENHANCEMENTS

MANUFACTURING TECHNIQUES/PROCESSES

- Photon Emission Microscope
- Fourier Transform Infrared Spectrometer/Gas Chromatography
- Improved Elemental Analysis Capability and Electron Beam Induced Current (EPIC) Imaging
- Thick/Thin Film Component Laser Trim System
- Parallel Seam Welder (also Increased Package Configuration Welding Capability)
- Microtester
- Elemental Analysis Machine
- Fluid Cell Press
- Automated Aircraft rework System

In Discussion:

- Thin Film Hybrid Capability
- Nondestructive Design Capture for Multi-Layer Circuit Boards
- Planning:
 - Focused Ion Beam Analysis
 - Improved Microcircuit Tester
 - Atomic Force Microscope
 - Confocal Laser Beam Microscope
 - Ion Chromatograph
 - Surface Mapping System for Complex Weapon System Components
 - 3 Axis NC Milling Machine
 - 4 Axis Wire EDM Machine
 - New Life Support Facility

REPAIR TECHNIQUES/PROCESSES

- MESHAP Compliant Paint Rooms
- Aqueous Cleaners for Avionics Repair
- NDI Automated Ultrasonic Inspection system (Estimated completion October 1998)
(Advanced Robotics Gantry Ultrasonic Scanner (ARGUS))

Planning:

- Robotic Plastic Media Blast for Aircraft Paint Removal

4.4.3 Commodities and Products

Aircraft

Accessories and Components
Armament
Avionics
Engines
General Purpose
Metal Airframe
Non-Metal Airframe
Support Equipment

Automotive Equipment

Accessories and Components
Armament

Communications/Electronics

Radar
Shelter/Housing
Support Equipment

General Support Equipment

Accessories and Components
Electronic Test Equipment
Heating & Air Conditioning
Machine Tools
Power Plant/Generator Set GTE

General Support Equipment

Power Plant/Generator Set Recip
Rail Equipment - Locomotives

Automotive Equipment

Communications
Electronics
Engine
Hull & Chassis

Combat Vehicles

Accessories and Components
Armament
Communications
Fire Control
General Purpose
Hull & Chassis
Support Equipment

Communications/Electronics

Accessories and Components
Electronics
General Purpose
Power Plants GTE
Power Plants Recip

Ships

Accessories and Components
General Purpose

4.4.4 Processes and Technologies

Cleaning/Stripping

Abrasive Flow
Agricultural Media Blast
Argon Plasma
Biodegradable Detergent and Water
Citric Acid
CO2 Blast
Flash Lamp
Fluidized Bed
Glass Media Blast
Grit Blast
Hazardous Chemicals

General Support Equipment

Rail Equipment - Rolling Stock
Topographic
Troop Support Equipment

Missile

Accessories and Components
GTE Propulsion
Guidance System
Liquid Propulsion
Missile Frame
Payload System
Solid Propulsion
Support & Launch
Surface Command & Control

Ordnance

Conventional Arms & Explosives
Small Arms

Cleaning/Stripping

Hydrazine Facility
Non-Hazardous Chemicals
Plastic Media Blast
Robotic F-15 Wash & Paint Preparation Sys
Sand Blast
Scuff Sand
Steam
Ultrasonic
Vapor Degreaser
Vibratory Finishing
Water Jet

Fabrication/Repair

Advanced Composites
Air Conditioning - Freon
Air Conditioning - Lithium Bromide
Autoclave Large
Autoclave Small
Blade/Vane
CAD/CAM
 - Artwork-Flat Wire Cables
 - Artwork-Printed Circuit Board
 - CNC & NC Programming
 - Drilling/Lathe/Punch
 - Engineering Analysis
 - Engineering Design/Drawings
 - Forming/Machining/Milling
 - Optical Elements
 - Printed Circuit Board
 - Sheetmetal
 - Vertical Internal Grinder
Ceramics
Certified Soldering
Chemical Machining/Milling
Class 1,000, 10,000 Clean Room
Class 100,000 Clean Room
CNC & NC Programming
CNC Forming/Machining/Milling
Coaxial Cable
Coaxial Cable - Flexible
Coaxial Cable - Rigid
Coaxial Cable - Rigid/Phase
Coaxial Cable - Semi-Rigid
Coaxial Cable - Semi-Rigid/Phase
Cryptographic
Cutting - Abrasive
Cutting - Laser
Cutting - Oxyfuel
Cutting - Plasma
Electronic ATE
Electronic Repair
EPROM/Prom Programming
Fiber Optics
Flame Spray
Flexible Machining Cell
Forming/Machining/Milling
Foundry - Ferrous

Fabrication/Repair

Foundry - Non-ferrous
Heat Treating
Hybrid Microcircuit
Hydrostatic
Investment Casting
Isostatic Press
ITA Housings
Ivadizer
Laser Center
Laser Welding
Machining - Drill Press
Machining - Lathe
Machining - Trace Milling
Magnaforming
Metal Finishing
Metrological
Molds
Optics
Phosandodize
Photo Etching
Plasma Spray
Plating - Cadmium
Plating - Cadmium/Chromium
Plating - Cadmium/Gold
Plating - Chromium
Plating - Copper
Plating - Electro
Plating - Electroless Nickel
Plating - Gold
Plating - Gold/Silver
Plating - Hard Chrome
Plating - Nickel
Plating - Nickel/Boron
Plating - Silver
Plating - Silver/Copper
Plating - Tin/Lead
Plating/Printed Circuit Board - Copper
Plating/Printed Circuit Board - Nickel/Gold
Plating/Printed Circuit Board - Tin/Lead
Precision Balancing
Printed Circuit Board
Robotic Auto Cleaning System
Robotic CARC Painting
Robotic Metal Spray

Fabrication/Repair

Robotic Painting
Robotic Plastic Media Blast
Robotic Welding
Rubber Products
Sheetmetal
Software - Application TPS
Software - ATE Operating System
Software - Multiple Languages
Software - Multiple Programs
Software - OFP
Software - Operational
Test Program Sets
Test Sets - Automatic
Test Sets - Manual
Tool and Die
Welding
Welding - Acetylene/Oxygen
Welding - Arc
Welding - Dabber TIG
Welding - Electron Beam
Welding - Laser
Welding - Plasma
Welding - TIG, MIG
Wiring Harness

Test and Inspection

Air/Fuel Flow
Aircraft Rigging
Anechoic Antenna Test Chamber
Antenna Test Range
ATE - RF
Auto-Optical PCB
Azimuth Alignment
Bearing Process
Bonding Test
Bonding Test (Integrated Circuits)
Burn-In
Calibration
Cold Proof
Coordinate Measuring Machine (CMM)
Dynamometer
Dynamometer - Chassis
Dynamometer - Engine

Test and Inspection

Dynamometer - Transmission
Eddy Current
Electron Microscope
Electron Microscope/EBIC
Electronic ATE
Electronic ATE - Analog
Electronic ATE - Analog (RF)
Electronic ATE - DATSA
Electronic ATE - Digital
Electronic ATE - Digital (RF)
Electronic ATE - Ditmco
Electronic ATE - General Hybrid
Electronic ATE - GenRad
Electronic ATE - Microwave
Electrostatic Discharge
Engine Test Cell - Automated
Engine Test Cell - Manual
Environmental Stress Screening
Environmental Vibration
Fiber Optics
Fluorescent Penetrant - Automated
Fluorescent Penetrant - Manual
Hush House
Hydraulic Systems
Hydrostatic
Laser Measuring
Laser Test Range
Leak Test
Load Test
Magnetic Particle
Microwave Component Test
NDI Magnetic Particle
Parametric Semiconductor
Radiography - Computed Thermography
Radiography - Neutron
Spectrographic Analysis
Stress
Stress - Centrifuge
Stress - ESS
Stress - Temperature Cycle
Tempest Test
Thermography
Type II Calibration Laboratory
Type II Laboratory/ PMEL

Test and Inspection

Ultrasonic - Automated

Ultrasonic - Manual

Vibration Testing

Video Inspection Probe

X-Ray - 3D

X-Ray - Computed Tomography

X-Ray - Film

X-Ray - Full F-15 Aircraft

X-Ray - Real Time

APPENDIX I

ACRONYMS/ABBREVIATIONS

ABIS	Automatic Blade Inspection System
ADAS	Automated Data Acquisition System
ADP	Automatic Data Processing
ADPE	Automatic Data Processing Equipment
AEP	Allison Electrophoretic Process
AERP	Advanced Equipment Repair Program
AFB	Air Force Base
AFLC	Air Force Logistics Command
AFMC	Air Force Materiel Command
AGMC	Aerospace Guidance and Metrology Center
AI	Artificial Intelligence
ALC	Air Logistics Center
ALCM	Air Launched Cruise Missile
AMC	Army Materiel Command
AMCCOM	US Army Armament, Munitions & Chemical Command
ANAD	Anniston Army Depot
AOD	Area Oriented Depot
AOE	Auxiliary Oiler/Explosive
APCD	Air Pollution Control District
APOE	Aerial Port of Embarkation
APOMS	Automatic Propeller Optical Measuring System
APU	Auxiliary Power Unit
AQP	Air Quality Plan
ASRS	Automatic Storage and Retrieval System
ASW	Above Sea Warfare
ATE	Automatic Test Equipment
ATEP	Automatic Test Equipment Program
AUTODIN	Automatic Digital Network
AUTOSEVCOM	Automatic Secure Voice Communications System
AWC	Automatic Work Changer
B	Billion
BAAQMD	Bay Area Air Quality Management District (term used in the San Francisco area)
BACT	Best Available Control Technology
BFVS	Bradley Fighting Vehicle System
CA	Computer Assisted
CAA	Clean Air Act
CAATS	Computer Aided Automatic Test System
CAD	Computer Aided Design
CAD/CAM	Computer Aided Design/Computer Aided Manufacturing
CADD	Computer Aided Design and Drafting System
CAM	Computer Aided Manufacturing
CAMDS	Chemical Agent Munitions Disposal System
CARC	Chemical Agent Resistive Coating

CCA	Circuit Card Assembly
CCAD	Corpus Christi Army Depot
CCWS	Computer Controlled Welding System
CEE	Commercial Equivalent Equipment
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act (also known as Superfund)
CIM/CIB	Computer Integrated Manufacturing/Computer Integrated Business
CIWS	Close In Weapons Study
CNC	Computer Numerically Controlled
CNO	Chief of Naval Operations
COMSEC	Communication Security
CONUS	Continental United States
CPSA	Consumer Product Safety Act
CPU	Central Processing Unit
CWA	Clean Water Act
DERA	Defense Environmental Restoration Account
DESCOM	US Army Depot Systems Command
DLA	Defense Logistics Agency
DLM	Depot Level Maintenance
DLMF	Depot Level Maintenance Facility
DMA	Depot Maintenance Activity
DMATS	Digital-Analog Module Test System
DMIF	Depot Maintenance Industrial Fund
DNC	Distributive Numerical Control
DOD	Department of Defense
DOHS	Department of Health Services
DOP	Designated Overhaul Point
DRMO	Defense Reutilization and Marketing Office
EA	Environmental Assessment
EBMUD	East Bay Municipal Utility District (term used in the San Francisco area)
EDM	Electric Discharge Machining
EDR	Electromagnetic Dent Remover
EPA	Environmental Protection Agency
ESP	Electrical Circuit Analyzer
F	Fahrenheit
FAA	Federal Aviation Administration
FAADS	Forward Area Air Defense System
FDCA	Federal Food, Drug and Cosmetic Act
FFCA	Federal Facilities Compliance Agreement
FIFRA	Federal Insecticide, Fungicide and Rodenticide Act
FMC	Flexible Machining Cell

FMF	Fleet Marine Force
FMS	Flexible Manufacturing System
FRC	Flexible Repair Center
FTC	Fault Tolerant Computing
GHz	Giga Hertz
GLCM	Ground Launched Cruise Missile
GOCO	Government Owned Contractor Operated
GPD	Gallons-Per-Day
GSA	General Services Administration
GSF or gsf	Gross Square Foot
GTE	Gas Turbine Engine
HAFB	Hill Air Force Base
HAZMIN	Hazardous Waste Minimization
HMTA	Hazardous Materials Transportation Act
HP	High Pressure
HQ	Headquarters
HQ AFLC	Headquarters, Air Force Logistics Command
HQ AMC	Headquarters, Army Materiel Command
HQMC	Headquarters, US Marine Corps
HW	Hazardous Waste
ICBM	Intercontinental Ballistic Missile
ID	Inside Diameter
IDROPS	Inspection Driven Repair Operations Planning System
IFTE	Intermediate Forward Test Equipment
IPM	Items Per Minute
IROAN	Inspect and Repair Only As Necessary
IWTP	Industrial Waste Treatment Plant
LAN	Local Area Network
LEAD	Letterkenny Army Depot
M	Million
MCA	Military Construction, Army
MCAS	Marine Corps Air Station
MCLB	Marine Corps Logistics Base
MICOM	US Army Missile Command
MISMA	Major Item Supply Management Agency
MLRS	Multiple Launch Rocket System
MRP	Material Resource Planning
MSC	Major Subordinate Command
MSFS	Maintenance Shop Floor System
MST	Maintenance Systems Technology

NAAQS	National Ambient Air Quality Standard
NAC	Naval Avionics Center
NADEP	Naval Aviation Depot (see also NAVAVNDEPOT)
NADOC	Naval Aviation Depot Operations Center
NAFI	Naval Avionics Facility, Indianapolis
NALC	Naval Aviation Logistics Center
NARDAC	Naval Regional Automation Command
NARF	Naval Air Rework Facility
NAS	Naval Air Station
NASA	National Aeronautics and Space Administration
NAVAIR	Naval Air Systems Command (see also NAVAIRSYSCOM)
NAVAIRSYSCOM	Naval Air Systems Command (also referred to as NAVAIR)
NAVAVNDEPOT	Naval Aviation Depot (also referred to as NADEP)
NAVELEX	Naval Electronic Systems Engineering Center (referred to mostly as NESEC)
NAVFAC	Naval Facilities Engineering Systems Command
NAVORDSTA	Naval Ordnance Station (also referred to as NOS)
NAVSEA	Naval Sea Systems Command
NAVSEASYS COM	Naval Sea Systems Command
NAVSUP	Naval Supply Systems Command
NAVWPNSTA	Naval Weapons Station (see WPNSTA)
NC	Numerical Control
NC/CAM	Numerical Control/Computer Aided Manufacturing
NDI	Non-Destructive Inspection
NDT	Non-Destructive Test
NEDED	Naval Explosive Development Engineering Department
NEESA	Naval Energy and Environmental Support Activity
NEPA	National Environmental Policy Act
NESEC	Naval Electronics Systems Engineering Center (see also NAVELEX)
NESECP	Naval Electronics Systems Engineering Center, Portsmouth
NESECS	Naval Electronics Systems Engineering Center, San Diego
NLOS	Non-Line of Sight Missile System
NOPI	Naval Ordnance Plant, Indianapolis
NOSLV	Naval Ordnance Station Louisville
NORIS	Naval Air Station, North Island
NOS	Naval Ordnance Station (see also NAVORDSTA)
NOV	Notice of Violation
NPDES	National Pollutant Discharge Elimination System
NSY	Naval Shipyard
NUWES	Naval Undersea Warfare Engineering Station
NWS	Naval Weapons Station (see WPNSTA)
NWSC	Naval Weapons Support Center (see also NWSCC)
NWSCC	Naval Weapons Support Center Crane (also referred to as NWSC and NAVWPNSUPPCEN CRANE)

OC-ALC	Oklahoma City Air Logistics Center
OCAMA	Oklahoma City Air Material Area
OD	Outside Diameter
OO-ALC	Ogden Air Logistics Center
OOAMA	Ogden Air Material Area
OPA	Oil Pollution Act
OSCR	Ordnance Systems Component Rework
OSHA	Occupational Safety and Health Act
PATE	Production, Acceptance, Test, and Evaluation
PCB	Printed Circuit Board
PMB	Plastic Media Blasting
POMFLANT	Polaris Missile Facility Atlantic
PSD	Prevention of Significant Deterioration
PRAM	Productivity, Reliability, Availability, and Maintainability
PSI	Pounds Per Square Inch
PSIG	Pounds Per Square Inch Gauge
PUDA	Pueblo Depot Activity
PWC	Public Works Center
QA	Quality Assurance
RCRA	Resources Conservation and Recovery Act
REPTCH	Repair Technology
RF	Rough Finish
RMSS	Robotic Metal Spray System
RPV	Remotely Piloted Vehicle
RRAD	Red River Army Depot
SA-ALC	San Antonio Air Logistics Center
SAAD	Sacramento Army Depot
SAAMA	San Antonio Air Material Area
SARA	Superfund Amendments and Reauthorization Act
SDI	Strategic Defense Initiative
SDLM	Selected Depot Level Maintenance
SDWA	Safe Drinking Water Act
SF or sf	Square Foot
SLEP	Service Life Extension Program
SLIMS	Shipyards Laboratory Information Management System
SM-ALC	Sacramento Air Logistics Center
SMAMA	Sacramento Air Material Area
SMD	Surface Mounted Device
SMSA	Standard Metropolitan Statistical Area
SPAWAR	Space and Naval Warfare Systems Command
SPCC	Ships Parts Control Center
SPCC	Spill prevention, control and countermeasures

SPO	Systems Program Office
SRAM	Short Range Attack Missile
SUBMEPP	Submarine Maintenance Engineering Planning and Procurement Team
SWDA	Solid Waste Disposal Act
SYSCOM	Systems Command
TACOM	US Army Tank Automotive Command
TEAD	Tooele Army Depot
TMDE	Test Measurement and Diagnostic Equipment
TYAD	Tobyhanna Army Depot
TOD	Tooele Ordnance Depot
TOSCA	Toxic Substance Control Act (also referred to as TSCA)
TPS	Test Program Set
TRC	Technology Repair Center
TROSCOM	US Army Troop Support Command
TRS	Technical Repair Standard
TSCA	Toxic Substance Control Act (see also TOSCA)
UAV	Unmanned Air Vehicles
UDATS	Underwater Damage Assessment Television System
USAEHA	US Army Environmental Health Agency
USAF	United States Air Force
USN	United States Navy
USW	Undersea Warfare
VOC	Volatile Organic Compound
VPI	Vacuum-Pressure Impregnation
WPCA	Federal Water Pollution Control Act
WPNSTA	Naval Weapon Station
WR-ALC	Warner Robins Air Logistics Center
WRAMA	Warner Robins Air Material Area

